

Abstract

Methods and systems for regenerating and pretreating oxides of manganese and precipitation of oxides of manganese from manganese salt solutions. Oxides of manganese, a slurry containing oxides of manganese or manganese salt solutions are mixed with heated aqueous oxidizing solutions and processed in a continuous process reactor. Temperature, pressure, Eh value, and pH value of the mixed solution are monitored and adjusted so as to maintain solution conditions within the MnO_2 stability area during processing. This results in regenerated, pretreated and precipitated oxides of manganese having high or increased pollutant loading capacities and/or oxidation states. Oxides of manganese thus produced are, amongst other uses; suitable for use as a sorbent for capturing or removing target pollutants from industrial gas streams. Filtrate process streams containing useful and recoverable value present as spectator ions may be further processed to produce useful and marketable by-products.

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